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discussion of the data has a wider interest than this however, and his remarks upon the philosophy of scientific method in general, are of permanent value. This is not the place to do more than to direct attention to this essay, which will have both a local and a general interest to our members. E. S. H.

VARIATIONS IN THE LATITUDES OF BERLIN, POTSDAM, PRAGUE  
AND STRASSBURG.

It is known that the four observatories named are making simultaneous determinations of their latitudes (by TALCOTT'S method) for the detection of short-period variations in this element. During the first half of 1889 no variations were found. The observations of the last half of the year seem to show that there has been a diminution of the latitude at all these observatories, amounting to about half a second of arc. The work is to be continued.

The observatories of Pulkowa, Copenhagen, Upsala and Lund are engaged in observations to determine the long-period changes of latitude, if such exist.

THE LATITUDE OF KOENIGSBERG.

Dr. RAHTS has compared his recent observations of *Polaris* with those of BESSEL, with the object of detecting any change in the latitude of Königsberg in the past forty years. Professor BRUNS of Leipzig, has reviewed Dr. RAHTS' memoir in the *V. J. S. der Ast. Gesell.*, vol. 25, p. 15; and the following is a free translation of his remarks on the nature of this problem:

"It is theoretically certain that the latitudes of stations on the earth are subject to variation, just as all other data which depend on the arrangements of the masses of matter in the earth's interior.

"A whole series of processes can be named, any one of which necessitates a corresponding change in the latitude. Furthermore, it is certain, empirically, that these changes, so far as they are to be detected at all, at present attain only such magnitudes as are just barely measurable with the extreme delicacy of modern observations. If now we wish to investigate variations of the latitude, and to be independent of assumed values for the declinations of stars, we must have recourse to measures of the meridian-zenith-distances of circumpolar stars, since, for known reasons, observations of the sun are of less precision.

"The value of the latitude depends, therefore, directly on the amount of the refraction at the zenith-distance of the pole. If, then,

we reduce observations made at two different times with the same refraction-tables, any difference between the two observations depends not only upon the variation of the latitude, but also upon the differences between the tabular and the true refractions at the two epochs. It is, to say the least, illogical to simply assume in an investigation of this nature a datum which depends on meteorological conditions to be constant, without further research. In other words, it is essential in each determination of an absolute latitude, to determine also and at the same time the correction of the refraction-table itself. If, for example, we examine closely the well-known table of variations of the latitude of Pulkowa, which NYRÉN has printed in his memoir on this subject, we shall easily see that the above-mentioned requirement is, in general, *not* fulfilled. It is sufficiently strange, and yet the fact can easily be established, that a statement to the effect that all the variations in the different determinations of the latitude of Pulkowa at different times are solely due to errors in the assumed refractions, cannot be controverted without a new series of observations, or a more complete discussion of the materials now in hand.

\* \* \* \* \*

“The latitude of Königsberg, from Dr. RAHTS’ observations, is  $54^{\circ} 42' 50''.43$  (observations of 1886–1887); BESSEL’S value is  $54^{\circ} 42' 50''.56$  (observations of 1842–1844). No attention has been paid in these observations to the important point above mentioned. This objection does not apply to the present work alone: for a glance into astronomical literature will show plainly that many astronomers regard a refraction-table as very much the same thing as—let us say—a table of logarithms, and use it in the same manner.”

#### LATITUDE OF WASHINGTON.

I have, among my papers, collections of all the observations available for such a discussion of the latitude of the Mural Circle of the United States Naval Observatory at Washington (1845–1878), and they are at the disposition of any one who has the necessary leisure to reduce them properly. Such a discussion would require a determination of the refraction and a thorough investigation of the division errors of the Mural Circle before it is dismounted from its place in the present observatory building.

E. S. H.

OCCULTATIONS OF STARS AT THE DARK LIMB OF THE MOON,  
OBSERVED WITH THE TWELVE-INCH EQUATORIAL.

By A. O. LEUSCHNER.

1890.	L. O. M. T.			STAR.	1855-o.		REMARKS.
					R. A.	DEC.	
	<i>h. m. s.</i>				<i>h. m. s.</i>	<i>°</i>	
Mar. 26	7 32 30.4			DM. (+22°) 946	5 25 15	+22 19	Good.
" 26	49 57.8			DM. (+22°) 949	5 26 11	+22 28	Good.
" 26	58 53.2			DM. (+22°) 950	5 26 17	+22 25	Good.
" 26	8 0 14.4			DM. (+22°) 948	5 26 10	+22 22	Good.
" 26	1 1.7			DM. (+22°) 951	5 26 26	+22 38	No remarks.
" 26	26 38.8			DM. (+22°) 952	5 26 40	+22 20	Good.
" 27	7 17 46.1			DM. (+23°) 1356	6 18 10	+23 49	Good.
" 27	34 58.3			DM. (+23°) 1357	6 18 35	+23 47	Gradually.
" 27	58 50.2			DM. (+23°) 1362	6 19 9	+23 46	Good.
" 27	8 28 48.8			DM. (+23°) 1360	6 19 3	+23 32	Minute doubtful.
" 27	35 39.6			DM. (+23°) 1368	6 19 58	+23 40	Good.
" 27	42 23.8			DM. (+23°) 1371	6 20 5	+23 55	Good.
Apr. 22	7 41 47.2			DM. (+21°) 797	5 5 51	+21 44	No remarks.
" 22	45 8.1			DM. (+22°) 860	5 6 1	+22 4	Good.
" 22	52 7.5			DM. (+22°) 858	5 5 50	+22 10	*Good.
" 22	8 10 47.5			108 Tauri	5 6 45	+22 7	{ Immersion, good. Emersion, ±0°.5.
" 22	52 51.7			108 Tauri			
" 22	9 46 10.8			π Tauri	5 10 34	+21 57	Good.
" 23	2 28 38.9			DM. (+23°) 1203	5 58 43	+23 45	Good.
" 23	38 35.5			DM. (+23°) 1206	5 59 6	+23 41	Good.
" 23	47 52.5			DM. (+23°) 1208	5 59 14	+23 46	Good.
" 23	56 2.1			DM. (+23°) 1210	5 59 25	+23 28	Good.
" 23	59 51.4			DM. (+23°) 1217	5 59 42	+23 42	Good.
" 23	8 11 58.8			DM. (+23°) 1212	5 59 29	+23 32	Good.
" 23	13 8.5			DM. (+23°) 1216	5 59 37	+23 23	Good.
" 25	7 32 2.2			DM. (+23°) 1833	7 44 15	+23 22	} Seeing poor.
" 25	35 30.6			DM. (+23°) 1836	7 44 46	+23 28	

LICK OBSERVATORY, April 29, 1890.

\* Entered the limb of the moon, and seen inside of the border for about 35; then suddenly disappeared.

## NOTE ON PHOTOGRAPHING THE DARK PART OF THE MOON.

It is found by experiments, made on the evening of April 21st, that the dark part of the moon, when the moon's age is 2.9 days, can be photographed with the twelve-inch Equatorial with a Seed 26 plate in twenty seconds—the complete outline of the dark part just showing with this exposure. With forty seconds and seventy seconds the dark part was conspicuous and details on it were clearly shown.

E. E. B.

COPIES OF PHOTOGRAPHS TAKEN AT THE LICK OBSERVATORY—  
HOW TO OBTAIN THEM.

The Director of the Lick Observatory has been authorized to supply copies of some of the negatives taken at Mount Hamilton to certain photographers, in order to make such copies available generally. Copies of some of our negatives have been furnished to quite a number of firms accordingly. Some of these firms (I. W. TABER, 8 Montgomery Street, San Francisco; HILL & WATKINS, Santa Clara Street, San José, and GAYTON A. DOUGLAS & Co., 185 Wabash Avenue, Chicago,) are prepared to furnish prints, enlargements and lantern slides from such negatives as they now have. Other negatives will be furnished to them from time to time.

E. S. H.

COMPANION OF *SIRIUS*.

P = 359°.6	D = 4".17	1890.252
361.6	4.20	.269
356.8	4.19	.304
<hr/> 359.7	<hr/> 4.19	<hr/> 1890.27

These measures were made with the 36-inch equatorial.

S. W. B.